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10/772,303	02/06/2004	Masataka Sakata	030658-098	7423

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EXAMINER

KAO, CHIH CHENG G

ART UNIT PAPER NUMBER

2882

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/772,303

Applicant(s)

SAKATA, MASATAKA

Examiner

Chih-Cheng Glen Kao

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/6/04, 8/24/04
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: (fig. 2, "X<sub>0</sub>").

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The abstract of the disclosure is objected to because the abstract may not exceed 150 words in length. Correction is required. See MPEP § 608.01(b).

### ***Claim Objections***

3. Claims 1, 2, and 7-13 are objected to because of the following informalities, which appear to be minor draft errors including grammatical and lack of antecedent basis problems.

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In the following format (location of objection; suggestion for correction), the following corrections may obviate their respective objections: (claim 1, line 6, “the requirements”; deleting “the”), (claim 1, line 7, “the angle of incidence”; replacing “the” with - -an- -), (claim 1, line 10, “the surface”; replacing “the” with - -a- -), (claim 2, lines 2-3, “the X-ray beam”; replacing “the” with - -an- -), (claim 7, line 2, “the X-ray receiving surface”; replacing “the” with - -an- -), (claim 8, line 2, “the X-ray receiving surface”; replacing “the” with - -an- -), (claim 9, line 2, “the X-ray receiving surface”; replacing “the” with - -an- -), (claim 10, line 2, “the X-ray receiving surface”; replacing “the” with - -an- -), (claim 11, line 2, “the X-ray receiving surface”; replacing “the” with - -an- -), (claim 12, line 2, “the X-ray receiving surface”; replacing “the” with - -an- -), (claim 13, line 4, “the form”; replacing “the” with - -a- -), (claim 13, line 8, “the angle”; replacing “the” with - -an- -), and (claim 13, lines 10-11, “the surface”; replacing “the” with - -a- -).

For purposes of examination, the claims have been treated as such. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 13 is rejected under 35 U.S.C. 102(b) as being anticipated by Iwasaki et al. (JP 09-229879).

Iwasaki et al. discloses a method comprising causing X-rays emitted from an X-ray source (fig. 1, "F") to strike a specimen (fig. 1, "S") in a form of either a divergent beam or a parallel beam (abstract), wherein in the case of using a divergent beam, said method further comprising steps of: shifting an angle of incidence of X-rays striking said specimen by rotating either said specimen or said X-ray source around a central axis of rotation running through a surface of the specimen; arranging a mask having a slit in front of said two-dimensional X-ray detecting means so as to make the slit to be located on a line intersecting a plane rectangularly intersecting said central axis of rotation and containing a central optical axis of incident X-rays; and moving said two-dimensional X-ray detecting means in parallel with said central axis of rotation in synchronism with the shift of the angle of incidence of X-rays relative to the specimen.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 4, 5, 7, 8, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doshiyou (JP 04-161843) in view of Dosho (US Patent 6285736).

6. Regarding claim 1, Doshiyou discloses an apparatus comprising a focusing optical system (fig. 1, #1 and 2) formed by arranging an X-ray source (fig. 1, #1) adapted to generate X-

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rays (fig. 1, x-rays from #1), specimen supporting means (fig. 1, #5) for supporting a specimen (fig. 1, #3) and two-dimensional X-ray detecting means (fig. 6, #19) for detecting X-rays from the specimen (fig. 6, #3) so as to satisfy requirements of the focusing optical system (fig. 1, #1 and 2), means for shifting by rotating (fig. 6, "C") said specimen (fig. 6, #3) around a central axis of rotation (fig. 6, "C") passing through a surface of the specimen (fig. 6, #3), means for moving (fig. 6, up arrow above #19) said two-dimensional X-ray detecting means (fig. 6, #19) in parallel with said central axis of rotation (fig. 6, "C"), and a mask (fig. 6, #8) arranged at a position in front of said two-dimensional X-ray detecting means (fig. 6, #19) as viewed from said specimen (fig. 6, #3) and having a slit (fig. 6, #7) on a line intersecting a plane rectangularly intersecting said central axis of rotation (fig. 6, "C") and containing a central optical axis of incident X-rays (fig. 1, x-rays from #1).

However, Doshiyou does not disclose means for shifting an angle of incidence of X-rays relative to a specimen by rotating said specimen or an X-ray source around a central axis of rotation passing through a surface of the specimen.

Dosho teaches means for shifting an angle of incidence (fig. 1,  $\theta_0$ ) of X-rays (fig. 1, from "F") relative to a specimen (fig. 1, S) by rotating said specimen (fig. 1,  $\omega$ ) or an X-ray source around a central axis of rotation (fig. 1,  $\omega$ ) passing through a surface of the specimen (fig. 1, S).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Doshiyou with the means for shifting an angle of Dosho, since one would be motivated to make such a modification to better satisfy the diffraction condition (col. 1, lines 18-25) as implied from Dosho to obtain a stronger signal.

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7. Regarding claim 2, Doshiyou as modified above suggests an apparatus as recited above.

However, Doshiyou does not disclose x-ray beam switching means adapted to switch an X-ray beam striking the specimen from a divergent beam to a parallel beam or vice versa.

Dosho further discloses x-ray beam switching means adapted to switch an X-ray beam (fig. 1, beam from "F") striking the specimen (fig. 1, S) from a divergent beam to a parallel beam (col. 6, lines 57-58) or vice versa.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to further incorporate the apparatus of Doshiyou with the parallel beam of Dosho, since one would be motivated to make such a modification to better control light onto the a micro-specimen (fig. 1) as implied from Dosho.

8. Regarding claims 4 and 5, Doshiyou further discloses wherein shifting and parallel movement of said two-dimensional x-ray detecting means are synchronized with each other (fig. 4).

9. Regarding claims 7, 8, 10, and 11, Doshiyou as modified above suggests an apparatus as recited above. Doshiyou further discloses wherein an x-ray receiving surface of said two-dimensional X-ray detecting means is that of a cylindrical shape (fig. 6, #19).

However, Doshiyou does not disclose wherein a surface of detecting means is that of a cylinder formed around a central axis of rotation.

Dosho further discloses wherein a surface of detecting means (fig. 1, #2) is that of a cylinder formed around a central axis of rotation (fig. 1,  $\omega$ ).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to further incorporate the apparatus of Doshiyou with the cylindrical detecting means of Dosho, since one would be motivated to make such a modification for more easily obtaining the peak diffraction intensity signal (fig. 1) as implied from Dosho.

10. Claims 3, 6, 9, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doshiyou and Dosho as applied to claim 2 above, and further in view of Hirose (GB 2270230).

For purposes of being concise, Doshiyou as modified above suggests an apparatus as recited above.

However, Doshiyou does not disclose mask supporting means arranged so as to allow a mask to move between a first position located in front of a two-dimensional X-ray detecting means and a second position not located in front of said two-dimensional X-ray detecting means.

Hirose teaches mask supporting means (fig. 1, #3) arranged so as to allow a mask (fig. 1, #2) to move between a first position (fig. 2d) located in front of a two-dimensional X-ray detecting means (fig. 1, #1) and a second position (fig. 2a) not located in front of said two-dimensional X-ray detecting means (fig. 1, #1).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Doshiyou as modified above with the mask supporting means of Hirose, since one would be motivated to make such a modification for image resolution enhancement (page 1, last sentence of Background of the Invention section) as implied from Hirose.



***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
gk

  
EDWARD J. GLICK  
SUPERVISORY PATENT EXAMINER